

PRELIMINARY REMARKS

This responds to the Office Action mailed on June 4, 2009. Claim 30 was canceled, claim 26 was amended; as a result, claims 1-4, 24-29, 31, and 33-40 are pending.

No rejection is asserted with respect to claim 30. Claim 30 has been canceled and all limitations of claim 30 have been amended to its independent claim 26. No new matter was added by this amendment. All claim limitations were previously examined on the merits. The Applicant respectfully requests claim 26 to be passed to allowance.

At page 16, the Office Action informally objects to the phrase "planar to" in the claims. No formal objection to this phrase has been asserted, however. The Applicant believes the phrase "planar to" is unambiguous. The Applicant notes the Office has used the phrase "planar to" to explain structural relationships in Chung:

at least one surface substantially planar to said microelectronic die active surface (see figure 7 where at least the left the side surface of encapsulant 150 is shown having a planar side surface running parallel to the planar side surface of die 140 and there obviously 'planar to')

(Office Action at page 2).

The Office uses and apparently understands the phrase "planar to" by use thereof in other substantive matters in the instant Office Action. The Applicant believes this issue is therefore resolved by the Office in favor of the language not being ambiguous by use of the Office of this expression in a manner that is clear and supported both by the text of the instant disclosure and the illustrations, along with the use by the Office in a consistent manner therewith.

REMARKS

§103 Rejection of the Claims

Claims 1-3, 25-29, 31-35 and 37-40 were rejected under 35 USC § 103(a) as being unpatentable over Chung (U.S. 6,288,905). The Applicants respectfully traverse the rejection and request the Office to consider the following.

Claim 1 defines the trace being both physically and electrically in contact with the “microelectronic die active surface”. Claim 1 requires “at least one first conductive trace disposed on said first dielectric material layer and in physical and electrical contact with said microelectronic die active surface” The Office calls out Chung’s bump 144 to be a trace as claimed. The Applicant believes Chung’s “bump 144” cannot be construed as a trace as it is understood by persons of ordinary skill in the art.

Because no structure in Chung meets the limitations of claim 1, all the claim limitations are not taught in Chung. The Applicant notes that no conclusion of obviousness has been articulated with respect to this rejection and therefore respectfully asserts for this reason also, that the rejection does not establish a *prima facie* case of obviousness. Withdrawal of the rejection is respectfully requested.

Claims 2-4 and 25 depend from claim 1. Because all the claim limitations are not taught in Chung and no conclusion of obviousness has been articulated with respect to this claim 1 from which these claims depend, the rejection fails to establish a *prima facie* case of obviousness. Withdrawal of the rejection is respectfully requested.

Regarding independent claim 26 and dependent claims 27-29, the Office is again using incorrect definitions of a trace. The Applicant has demonstrated these definitions are incorrect.

In previous Office Actions, the Office called out Chung’s structure 120 as the “first dielectric material layer” that is claimed. But Chung’s trace (metal layer 100) is “disposed on said first dielectric material layer” as claimed.

The Office has asserted several structures in composite are a “trace”. But Chung’s trace 110 is not “in physical and electrical contact” Chung’s active surface. Several intervening structures are between Chung’s trace 110 and Chung’s active surface.

Chung’s trace 110 is in physical contact with Chung’s “via conductor 132b” and not with the active surface. The Applicant believes Chung’s “via conductor 132b” cannot be construed as a trace as it is understood by persons of ordinary skill in the art. Further, Chung’s via conductor 132b is in physical contact with Chung’s “oxidation-resistant material 134b” and not with the active surface. The Applicant believes Chung’s “oxidation-resistant material 134b” cannot be construed as a trace as it is understood by persons of ordinary skill in the art. Even further,

Chung's oxidation-resistant material 134b is in physical contact with Chung's "bump 144" and not with the active surface. The Applicant believes Chung's "bump 144" cannot be construed as a trace as it is understood by persons of ordinary skill in the art. It is only Chung's bump 144 that is in physical contact with Chung's active surface at the "contact pad 142b".

The Applicant respectfully asserts the "first conductive trace" is a single structure with no junctions, as supported by the specification, and as supported by the definition provided by the Office in a previous Office Action. Further, previously submitted selected sections of Harper: "Electronic Packaging and Interconnection Handbook" (3rd Ed., McGraw-Hill 2000) are submitted to support Applicant's assertion that a "trace" is a well-known structure and it is distinct from Chung's "via conductor 132b", Chung's "oxidation-resistant material 134b", Chung's "bump 144", and Chung's "contact pad 142b". Particular attention may be drawn to the selected sections taken from Harper.

For example, in Section 14.2.1.3, Harper structurally distinguishes a trace from a bond finger, a filled via, a wire, and a solder ball. Chung makes similar distinctions, particularly at least with a bump, a via, and a contact pad.

In Section 14.2.2.1, Harper structurally distinguishes a trace from a wire bond, a via, and a solder ball. These he characterizes as "cylindrical linear elements", and traces as "rectangular linear elements". The point the Applicant wishes to make is that Harper considers a trace not only different from one of these structures but structurally different from all of them. Chung makes similar distinctions, particularly at least with a bump, a via, and a contact pad.

In Section 14.2.2.4, Harper structurally distinguishes a trace in accordance with the definition provided by the Office. Figure 14.10 shows traces, to quote from the definition, "*on the surface of or sandwiched inside a PCB, printed circuit board*" (see "Computer, Telephony & Electronics Industry Glossary" <http://www.csgnetwork.com/glossaryt.html>, below, emphases added, and cited to by the Office previously).

But it should be understood that in every instance where Harper refers to a "trace" his reference is consonant with Applicant's disclosure as taught and claimed. Further, there is no instance where Harper's teaching of a trace that can be construed to be any of Chung's "via conductor 132b", "oxidation-resistant material 134b", Chung's "bump 144", and Chung's "contact pad 142b".

The Applicant believes this reference to a packaging and interconnection handbook (Harper) has demonstrated that a trace is understood by persons of ordinary skill in the art as a distinct structure that should not be aggregated with other structures such as via conductors, bumps, and pads among other non-trace structures.

Regarding claim 26, claim 30 was added in all limitations to claim 26. Chung fails to teach these limitations. Because each and every element of claim 26 is not taught by Chung, withdrawal of the rejection is respectfully requested. Because claims 27-29 depend from claim 26, withdrawal of their rejections is also respectfully requested.

Regarding claim 31, for reasons similarly to those set forth for claim 1, above, it is believed that Chung does not teach every element of claim 31. Because claims 33-35 and 37 depend from claim 31, withdrawal of their rejections is also respectfully requested.

Regarding claim 38, for reasons similarly to those set forth for claim 1, above, it is believed that Chung does not teach every element of claim 38. Because claims 39-40 depend from claim 38, withdrawal of their rejections is also respectfully requested.

§102 Rejection of the Claims

Claims 1 and 31 were rejected under 35 USC § 102(b) as being anticipated by Fordemwalt et al. (U.S. 3,407,479). The Applicants respectfully traverse the rejection and request the Office to consider the following.

Claim 1 requires “at least one first conductive trace disposed on said first dielectric material layer and in physical and electrical contact with said microelectronic die active surface”

Claim 1 requires the conductive trace to extend adjacent the die side as well as adjacent the encapsulation material. Fordemwalt does not show a die side, as he illustrates “islands” (e.g. column 2, line 47) in a single wafer with cut-away edges that are indeterminate as to a die side. It therefore cannot be ascertained whether Fordemwalt teaches conductive trace to extend adjacent the die side. Consequently, Fordemwalt does not teach or enable what is claimed.

Regarding claim 1, Fordemwalt’s connector fails to teach at least one limitation of claim 1, “wherein said at least one first conductive trace extends adjacent said microelectronic die

active surface”. Fordemwalt also fails to teach at least one limitation of claim 1, “wherein said at least one first conductive trace extends . . . adjacent said encapsulation material surface”.

Because each and every element as set forth in claim 1 is not found, either expressly or inherently described, in Fordemwalt, withdrawal of the rejection is respectfully requested.

Regarding claim 31, Fordemwalt fails to teach at least the limitation “wherein said at least one conductive trace extends adjacent said microelectronic die active surface”. Because each and every element is not found, either expressly or inherently described, in Fordemwalt, withdrawal of the rejection is respectfully requested.

§103 Rejection of the Claims

Regarding claim 26, Fordemwalt fails to teach the limitation “encapsulation material includes. . . at least one surface planar to said microelectronic die back surface.” The Applicant notes that no conclusion of obviousness has been articulated with respect to this rejection and therefore respectfully asserts for this reason also, that the rejection does not establish a *prima facie* case of obviousness. Withdrawal of the rejection is respectfully requested.

Because each and every element of claim 26 is not taught by Fordemwalt, withdrawal of the rejection is respectfully requested. Because claim 27 depends from claim 26, withdrawal of its rejection is also respectfully requested.

Claims 1, 26 and 27 were also rejected under 35 USC § 102(a) as being anticipated by Nishihara et al. (U.S. 6,013,953). The Applicants respectfully traverse the rejection and request the Office to consider the following.

The Office states Nishihara has a trace 2 in physical and electrical contact with said microelectronic die active surface. (Office Action at page 9). But it is the bond pad 9 and not the trace 2 that is in physical contact with the die active surface. All limitations are not taught in Nishihara.

The other limitations cited in the Office Action may describe what is disclosed in Nishihara et al., but claim 1 requires “at least one first conductive trace disposed on said first dielectric material layer and in physical and electrical contact with said microelectronic die

active surface” Nishihara’s trace (copper through-hole 5) is not disposed on the first dielectric material (adhesive 3) which is on the active surface of the chip 1. Consequently, the limitation of a first dielectric on the active surface and the trace on the first dielectric is not met in Nishihara.

Nishihara’s trace is not in physical contact with the active surface, rather with a “connection terminal 9” that is prominent from the active surface. Because each and every element as set forth in claim 1 is not found, either expressly or inherently described, in Nishihara et al., withdrawal of the rejection is respectfully requested.

Regarding claim 26, Nishihara fails to teach the limitation “encapsulation material includes. . . at least one surface planar to said microelectronic die back surface.” Because each and every element of claim 26 is not taught by Nishihara et al., withdrawal of the rejection is respectfully requested. Because claim 27 depends from claim 26, withdrawal of its rejection is also respectfully requested.

Claims 1, 4, 24, 26, 27, 31, 35, 36 and 38-40 were also rejected under 35 USC § 102(b) as being anticipated by Donovan et al. (U.S. 3,343,255).

Claim 1 has the limitation of “wherein said at least one first conductive trace extends adjacent said microelectronic die active surface and adjacent said encapsulation material surface”. This limitation is not taught in Donovan. The Office Action incorrectly refers to a “trace 32” that is an “ohmic contact 32”. The ohmic contact 32 is not a trace as taught, claimed, and understood by persons of ordinary skill in the art. The ohmic contact 32 also does not have the structural limitation of “wherein said at least one first conductive trace extends adjacent said microelectronic die active surface and adjacent said encapsulation material surface” as claimed. Because each and every element of claim 1 is not taught by Donovan, withdrawal of the rejection is respectfully requested.

Claims 4 and 24 depend from claim 1 and are therefore not anticipated. Further, Donovan fails to teach the limitation of claim 24, particularly the limitation the “said encapsulation material is adjacent at least a portion of said at least one heat dissipation device.” The Office previously admitted this deficiency in Donovan. Withdrawal of the rejections is respectfully requested.

Regarding claim 26, Donovan fails to teach the limitation “encapsulation material includes . . . at least one surface planar to said microelectronic die back surface.” Because each and every element of claim 26 is not taught by Donovan, withdrawal of the rejection is respectfully requested. Because claims 27 and 30 depend from claim 26, claims 27 and 30 are also not anticipated and withdrawal of the rejections is also respectfully requested.

Regarding claim 31, Donovan fails to teach at least the limitation, “at least one first conductive trace disposed on said first dielectric material layer and in physical and electrical contact with said microelectronic die active surface”. Donovan also fails to teach at least the limitation “wherein said at least one first conductive trace extends adjacent said microelectronic die active surface”. Because each and every element is not found, either expressly or inherently described, in Donovan, withdrawal of the rejection is respectfully requested. Because claims 32, 35, and 36 depend from claim 31, withdrawal of their rejections is also respectfully requested.

Regarding claim 38, Donovan fails to teach at least the limitation, “at least one first conductive trace disposed on said first dielectric material layer and in physical and electrical contact with said microelectronic die active surface”. Donovan also fails to teach at least the limitation “wherein said at least one first conductive trace extends adjacent said microelectronic die active surface”. Because each and every element is not found, either expressly or inherently described, in Donovan, withdrawal of the rejection is respectfully requested.

§103 Rejection of the Claims

Claims 4, 24, 35 and 36 were rejected under 35 USC § 103(a) as being unpatentable over Chung or Nishihara et al. of Fordemwalt et al. in view of Donovan et al. The Applicants respectfully traverse this rejection and requests the Office to consider the following.

The Applicants incorporate all the discussion regarding the inadequacy of the previously cited references to teach each and every element of what is claimed. In particular, none of the references alone or in combination teach a trace as claimed and as understood by persons of ordinary skill in the art.

The Office Action admits that Chung or Nishihara or Fordemwalt do not teach a heat dissipation device. However, what teaching Donovan et al. adds to teach a heat dissipation device, does not amount to a teaching or suggestion of all the limitations of claims 4, 24, 35, and 36 as set forth in this Amendment and Reply. Further, where heat dissipation (or heat dissipation

at all, for that matter) is not mentioned in Chung and/or Donovan et al., the Office Action has used the Applicants' disclosure as a guide to make the claimed combination. Withdrawal of the rejections is respectfully requested.

RESERVATION OF RIGHTS

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this reply, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (503) 712-3485 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-0221.

Respectfully submitted,

QING MA, ET AL.

By their Representatives,

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By



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